

REMARKS

I. Introduction

Upon entry of the present amendment, claims 1-21 will be pending in this application. Claims 1, 11, and 12 have been amended to clarify certain aspects of the invention. New claim 21 has been added to include the limitation removed from claim 1. Based on the following remarks, Applicants respectfully request reconsideration and allowance of the pending claims.

II. Claim Objections

The Examiner has objected to claim 1 for including “separator” in parenthesis following “a flow field plate.” Appropriate correction has been made. The “separator” term has been removed and presented in new dependant claim 21.

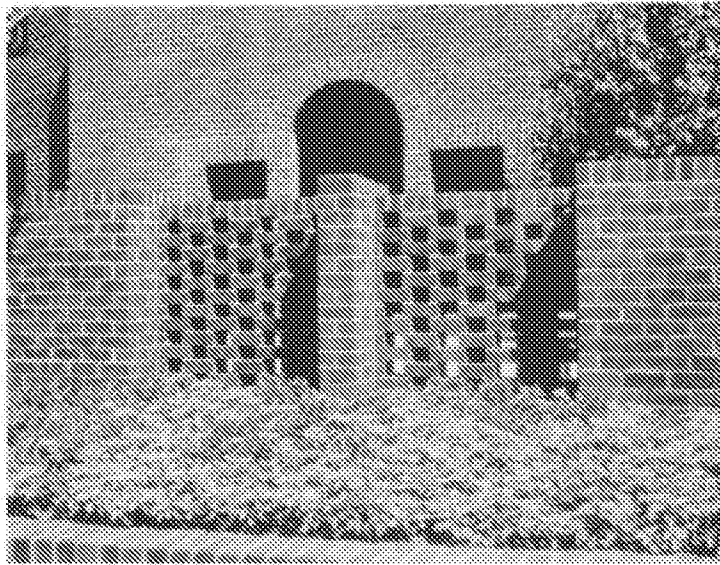
III. 35 U.S.C. § 112

The Examiner has rejected claims 10 and 11 under 35 U.S.C. § 112, stating that the terms “substantially” and “strongly” are relative terms that render the claims indefinite. Without acquiescing to the Examiner’s rejection, Applicants have removed the term “strongly” from claim 11.

However, Applicants traverse the Examiner’s rejection regarding the term “substantially.” “Substantially” has been held to be definite when one of ordinary skill in the art would know what is meant by the use of the term. *See, e.g.*, MPEP 2173.05(b)(D), citing *Ex parte Attig*, 7 USPQ2d 1092 (Bd. Pat. App. & Inter. 1986). In the present case, the Examiner has failed to state why one of ordinary skill in the art would *not* be reasonably apprised of the scope of the invention due to recitation of “fluid channels have substantially

constant width.” It is clear that this claim is intended to define fluid channels that have a relatively constant width, but that slight variations are possible, as long as the widths remain substantially constant. In fact, removing the term “substantially” could actually render the claim indefinite, because then the question would arise—do the channels have to be exactly, precisely the same or if there is a small variation, does that fall into the scope of the claim? The use of the term “substantially” thus clears up this potential ambiguity, and Applicants respectfully submit that the claim term is definite as presented—and necessary to a proper understanding of the invention. To the extent that the Examiner disagrees, clarification of this rejection (and how the claim as presented would be confusing to one of ordinary skill in the art) is respectfully requested.

The Examiner has also rejected claims 12 and 16 under 35 U.S.C. § 112, second paragraph, as being indefinite. The Examiner states that regarding claim 16, it is unclear how the permeable wall can also be impermeable. Applicants submit that a permeable wall made of an impermeable materials is not indefinite at all. The concept is described in the specification at least at pages 9-11. Applicants further submit the below visual as just one example of a permeable wall formed from impermeable barriers:



A common perforated wall detail adapted to a pier-and-panel configuration.

same dimensions. The reduced wind load that results from the perforations is

It is clear that the bits of the wall (the bricks) are impermeable, whereas the apertures in the wall itself (the gaps between the bricks) made the wall permeable. To the extent that the Examiner maintains this rejection, clarification of the confusion is respectfully requested.

Regarding claim 12, the Examiner states that it is unclear what the applicant means by indicating that the lands are not aligned with the symmetry of the arrangement of the lands. Applicants submit that this feature is described in the specification at least at page 14, first paragraph. That passage states that “by strongly varying the width of the channels[,] water droplet instability can be promoted,” followed by the claimed example. In other words, because the symmetry of the individual lands is not the same as and in alignment with the symmetry of the arrangement of the lands, the channels defined do not form channels of

constant width. Accordingly, without acquiescing to the Examiner's rejection but in the interest of advancing the prosecution of this application, Applicants have amended claim 12 to define the invention even more fully.

IV. 35 U.S.C. § 102

A. Turpin

The Examiner has rejected claims 1-3, 8-11, 16, and 19 under 35 U.S.C. § 102(a) as being anticipated by G.B. Patent Application No. 2387476 to Turpin. The Examiner submits that Turpin teaches every element of the rejected claims. Applicants respectfully traverse this rejection and request reconsideration and withdrawal thereof.

First, the Turpin publication is not 102(a) prior art against the present application as suggested. The 102(a) date of the Turpin application is its publication date – October 15, 2003. This is *after* Applicants' earlier priority dates of June 18, 2003 (PCT/GB03/002621) and July 18, 2003 (GB Application No. 0316946.3, which presented claim 1 for the first time). Therefore, the Turpin publication was not published before the invention by the Applicants.

Second, the Turpin application does not disclose a network of "interconnected" fluid diffusion channels as claimed. The Examiner has identified the Turpin diffusion channels 10 as comparable to the claimed "secondary gas diffusion channels" and the Turpin permeable membranes 9 as the claimed "array of lands" forming a network of interconnected fluid diffusion channels therebetween. However, as illustrated below, the Turpin channels 10, marked in red below, are *not interconnected*, but rather connect directly to the gas delivery channels and sub-channels 4,5, and gas removal channels and sub-channels 7,8.

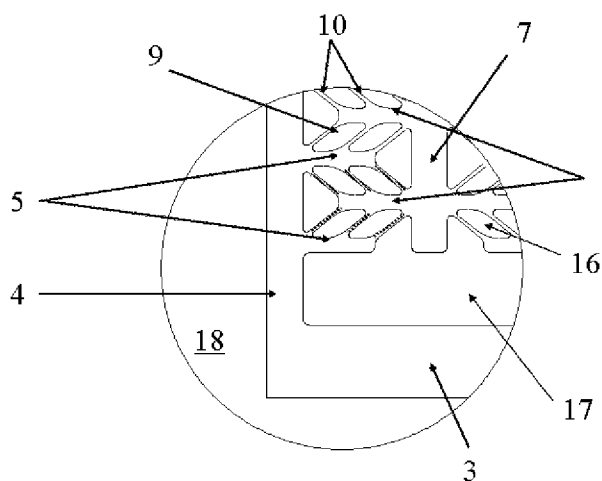


Fig. 2

Applicants respectfully submit that although channels 10 are gas diffusion channels, it is evident that these channels are not *interconnected* as claimed. Each channel is connected at one end to a gas delivery channel and at the other end to a gas removal channel. No gas diffusion channel is connected to another gas diffusion channel so there is not a “network of *interconnected* fluid diffusion channels.”

By contrast, the channels of the present invention form an interconnected network, *see. e.g.*, Figs. 4 and 7 reproduced below, with the interconnected network shown in red.

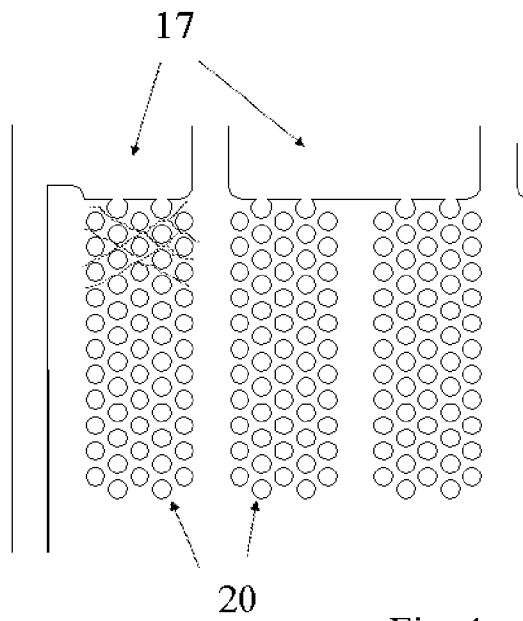
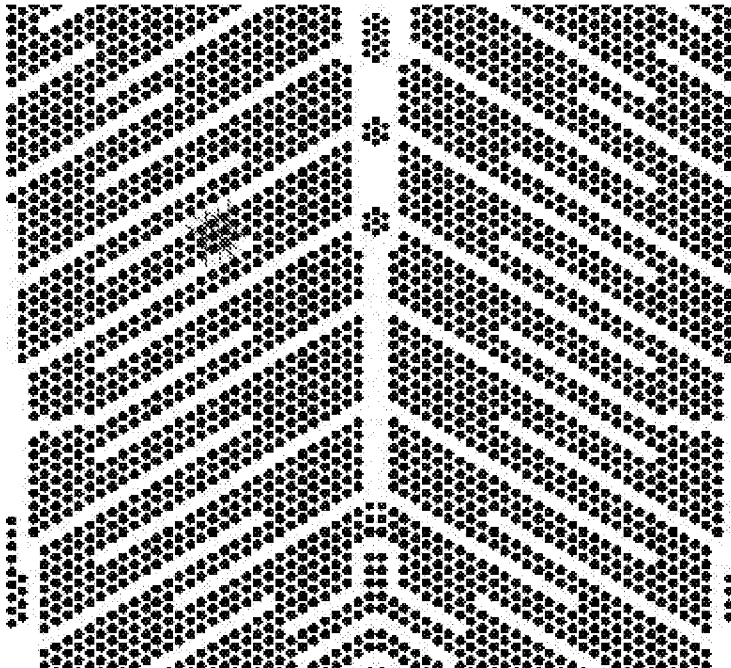


Fig. 4



The Examiner has also failed to point to any structure in the Turpin application that can be characterized as the claimed “one or more primary branched fluid delivery/removal channels feeding narrower secondary fluid diffusion channels.”

It is well-settled that “[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *See* MPEP § 2131; *Verdegaal Bros. V. Union Oil Co. of Calif.*, 814 F.2d 628, 631 (Fed. Cir. 1987). Because Applicants have shown that Turpin does not teach or disclose each and every claimed element, it is respectfully submitted that this rejection should be reconsidered and withdrawn.

B. Wilkinson

The Examiner has rejected claims 1, 7, and 18 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent Publication No. 2001/0041281 to Wilkinson. The Examiner submits that Wilkinson teaches every element of the rejected claims. Applicants respectfully traverse this rejection and request reconsideration and withdrawal thereof.

Claim 1 of present application recites “one or more branched primary fluid delivery/removal channels feeding narrower secondary fluid diffusion channels...” The Examiner characterizes Wilkinson channels 24 and 25 as the claimed “fluid diffusion channels,” but fails to identify what portion of the Wilkinson design provides the claimed “branched primary fluid delivery/removal channels.” This is because no such elements exist in Wilkinson. Wilkinson discloses matrix flow fields, and matrix flow fields are described as inadequate in the present specification. *See, e.g.*, page 4, lines 20-24.

The Examiner also fails to point to any Wilkinson feature that be characterized as the

claimed channels “feeding narrower secondary fluid diffusion channels.” In fact, this entire element is left out of the Examiner’s recitation of the claim in the rejection

Rejected dependent claims 7 and 18 also include the features recited by claim 1, and as such, should also be considered patentable for at least the above reasons. Moreover, regarding claim 7, the Examiner submits that Wilkinson discloses branched primary fluid delivery/removal channels that comprise a hexagonal network of channels, referring to Fig. 2c. Again, the Examiner has failed to identify what feature of the Wilkinson patent provides the claimed “branched” channels. The lines added by the Examiner to Wilkinson Fig. 2c are intended to demonstrate what the Examiner characterizes as the claimed “hexagonal network.” However, if the lines added inside the channel identify those channels as being the hexagonal branched primary fluid delivery/removal channels, then the Examiner has failed to identify what feature is considered the “network of interconnected fluid diffusion channels.” The same feature cannot be identified as two separate claimed elements. Applicants’ claims require these elements as two distinguishable, separate features. As such, the Examiner has failed to shown how the Wilkinson patent teaches or suggests each and every claimed feature, and Applicants respectfully request that this rejection be withdrawn.

V. 35 U.S.C. § 103

A. Turpin in view of McElroy or Ernst

The Examiner has rejected claims 4-6 under 35 U.S.C. § 103(a) as being unpatentable over Turpin in view of U.S. Patent No. 5,945,232 to McElroy or U.S. Patent No. 5,945,232 to Ernst. The Examiner admits that Turpin does not expressly teach that the flow field segments are arranged as claimed, but submits that (1) McElroy teaches flow field plates that

can be arranged so that the flow of gas through fuel stacks is in parallel in some conditions and in series under other conditions for the benefit of optimum flow based on the fuel cell's power output and (2) Ernst teaches a flow plate comprising a plurality of fluid flow sub-plates (segments) connected in series or in parallel or a combination thereof, to provide higher output voltage. The Examiner's position is that it would have been obvious to arrange the flow field segments of Turpin in either of the configurations of series and parallel connect in series or parallel in order to arrive at the claimed invention. Applicants respectfully traverse this rejection and request reconsideration and withdrawal thereof.

First, without acquiescing to the proper combinability of the cited references or any of the Examiner's rejections, Applicants submit that the features of the rejected claims (which depend from claims 1 and 2, discussed above in Section IV(A)) should be found patentable at least for the above-discussed reasons with respect to the Turpin patent, namely that that the Turpin patent is not prior art, and it fails to teach or suggest the claimed interconnected diffusion channels.

Second, even if the references are combined as suggested, the claimed invention would not result. McElroy does not teach flow field segments arranged in parallel or in series on the plate – it teaches parallel or series flow through separate plates. Ernst does not teach flow field segments arranged in parallel or in series on the plate – it teaches isolated segments on each plate, these isolated segments being arranged in stacks, with flow being in parallel or in series through the stacks. For at least these reasons, Applicants respectfully request that this rejection be withdrawn.

B. Turpin in view of Abdou

The Examiner has rejected claims 12-15 under 35 U.S.C. § 103(a) as being unpatentable over Turpin in view of International Patent Application No. WO 02/069426 to Abdou. The Examiner's position is that Abdou discloses diamond and hexagonal lands which are aligned on a hexagonal array. Applicants respectfully traverse this rejection and request reconsideration and withdrawal thereof.

Without acquiescing to the proper combinability of the cited references or any of the Examiner's rejections, Applicants submit that the features of the rejected claims should be found patentable at least for the above-discussed reasons with respect to the Turpin patent, such that even if Turpin is combined with Abdou as suggested, the claimed invention would not result. Moreover, Abdou discloses a matrix flow field, the disadvantages of which are detailed in the present application as not providing the claimed structure or the described advantages. For at least these reasons, Applicants respectfully request that this rejection be withdrawn.

CONCLUSION

For at least the above reasons, Applicants respectfully request allowance of the pending claims and issuance of a patent containing these claims in due course. If the Examiner believes there are any issues that can be resolved via a telephone conference, or if there are any informalities that can be corrected by an Examiner's amendment, he is invited to contact the undersigned.

Respectfully submitted,

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